CLAIMS

1. An optical path switching device comprising a light transmitting portion where a plurality of refraction regions are formed so that the refractive index of light can be controlled uniformly in a direction perpendicular to a direction in which light propagates by using an electro-optic effect, the thickness of the light transmitting portion varying along the direction in which light propagates, a first electrode layer and a second electrode layer which are formed so as to sandwich the light transmitting portion and cover at least the portions of the refractive regions, a first support portion which is placed so as to make close contact with the first electrode layer via a first adhesive layer on a side that does not make contact with the light transmitting portion, and a second support portion which is placed so as to make close contact with the second electrode layer via a second adhesive layer on a side that does not make contact with the light transmitting portion.

2. The optical path switching device according to claim 1, wherein the light transmitting portion has an entrance surface and an emission surface which are approximately perpendicular to the direction in which light propagates, and the thickness of the light transmitting portion varies substantially symmetrically relative to an optical axis of light in such a manner as to increase in step form nearer the emission surface, the light entering approximately perpendicularly the entrance surface.

3. The optical path switching device according to claim 1, wherein the light transmitting portion has an entrance surface and an emission surface which are approximately perpendicular to the direction in which light propagates and wherein the thickness of the light transmitting portion in the direction perpendicular to the direction in which light propagates varies in such a manner as to increase in step form nearer the emission surface, and while one of electrode-formed surfaces varies relative to an optical axis of light that enters approximately perpendicularly the entrance surface, the other electrode-formed surface is formed as a plane without steps.

4. The optical path switching device according to claim 1, wherein the light transmitting portion has an entrance surface and an emission surface which are approximately perpendicular to the direction in which light propagates, and the thickness of the light transmitting portion in the direction perpendicular to the direction in which light propagates varies in such a manner as to increase in taper form nearer the emission surface.

5. The optical path switching device according to any of claims 1 to 4, wherein the light transmitting portion is formed of a crystal material that has an electro-optic effect through application of a voltage.

6. The optical path switching device according of any of claims 1 to 5, wherein the first electrode layer and second electrode layer are

each formed of either a single body or portions which are physically separated from each other.

7. The optical path switching device according to any of claims 1 to 6, wherein the first support portion and the second support portion are each formed of a conductive material.

8. The optical path switching device according to any of claims 1 to 6, wherein the first support portion and the second support portion are each formed of an insulating material having at least one through hole, a first external electrode is formed on a surface of the first support portion which does not make contact with the light transmitting portion, a second external electrode is formed on a surface of the second support portion which does not make contact with the light transmitting portion, and the first electrode layer and the first external electrode are conductively connected to each other as well as the second electrode layer and the second external electrode are conductively connected to each other, each of the connections being made through said at least one through hole.

9. A manufacturing method for the optical path switching device according to claim 2, comprising the steps of: making a light transmitting portion adhere to a temporary support member, the light transmitting portion having refractive regions; processing a surface of the light transmitting portion opposite to the temporary support

member side into a first repeating structure in step form; forming a first electrode layer on the first repeating structure; making a first support portion adhere to the light transmitting portion via a first adhesive layer, the first support portion having a surface that makes contact with the first electrode layer and that has been processed into a second repeating structure in step form, the adhesion being made so that the first and second repeating structures are joined to each other; removing the temporary support member; forming a third repeating structure in step form in the other surface of the light transmitting portion from which the temporary support member has been removed; forming a second electrode layer on the third repeating structure; making a second support portion adhere to the light transmitting portion via a second adhesive layer, a surface of the second support portion that makes contact with the second electrode layer having been processed into a fourth repeating structure in step form, the adhesion being made so that the third and fourth repeating structures are joined to each other; cutting and dividing the resulting product into a plurality of structures using end portions of any of the repeating structures in step form as a cutting reference; and polishing and processing the end surfaces that have been obtained by the cutting.

10. A manufacturing method for the optical path switching device according to claim 3, comprising the steps of: forming a first electrode layer on a flat surface of a light transmitting portion, the light transmitting portion having refractive regions; making the flat surface of

the light transmitting portion adhere to a first support portion via a first adhesive layer; processing the other surface of the light transmitting portion that does not make contact with the first support portion into a repeating structure of a plurality of steps; forming a second electrode layer on the repeating structure; making a second support portion adhere via a second adhesive layer to the surface of the light transmitting portion having the second electrode layer formed thereon, the second support portion having a surface that does not make contact with the light transmitting portion and that has a repeating structure in serrated form, the repeating structure in serrated form having the same period as the repetition period of the repeating structure in step form; and cutting and dividing the resulting product into a plurality of structures using end portions of the repeating structure in serrated form of the second support portion as a cutting reference.

11. A manufacturing method for the optical path switching device according to claim 4, comprising the steps of: forming a first electrode layer on a flat surface of a light transmitting portion, the light transmitting portion having refractive regions; making the flat surface of the light transmitting portion adhere to a first support portion via a first adhesive layer; processing the other surface of the light transmitting portion that does not make contact with the first support portion into a plurality of repeating structures in taper form; forming a second electrode layer on the repeating structure in taper form; making a second support portion adhere via a second adhesive layer to the

surface of the light transmitting portion having the second electrode layer formed thereon, the second support portion having a surface that does not make contact with the light transmitting portion and that has a repeating structure in serrated form, the repeating structure in serrated form having the same period as the repetition period of the taper form; and cutting and dividing the resulting product into a plurality of structures using end portions of the repeating structure in serrated form of the second support portion as a cutting reference.